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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/009,790	12/04/2001	Jan-Mark Geusebroek	JAB-1510	5797

7590 09/09/2004

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EXAMINER	
ROSARIO-VASQUEZ, DENNIS	

ART UNIT	PAPER NUMBER
2621	

DATE MAILED: 09/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/009,790	Applicant(s) GEUSEBROEK, JAN-MARK	
	Examiner Dennis Rosario-Vasquez	Art Unit 2621	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 12/04/2001.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-28 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-28 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 04 December 2001 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 12/04/2001.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

2. The disclosure is objected to because of the following informalities:

Page 2, line 30:"regularly" ought to be amended to "regular".

Page 5, line 22: ought to be amended to "In the above method, **the** apparatus and mechanism **where** the spatial extent of the"

Page 10, line 7:"microscope 1" ought to be amended to "microscope 10".

Page 12, line 9:"2A" ought to be amended to "3A".

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1 are rejected under 35 U.S.C. 102(b) as being anticipated by Ortyn et al. (US Patent 5,841,124 A).

Regarding claim 1, Ortyn et al. discloses a method of autofocus of an optical instrument for viewing an object and having an auto-focusing mechanism, comprising the steps of:

Step 1: acquiring a first digital image (fig. 14, num. 316 receives an image via arrow 310) of the object (Oval shape next to numeral 508.) through the optical instrument (Fig. 14, num. 302 has magnification modes), the first digital image (fig. 14, num. 316) comprising a plurality of pixels having pixel values (The first image is formed from a CCD array of a camera as mentioned in col. 17, lines 48-52.);

Step 2: applying a digital gradient filter (Fig. 14, num. 540 has a filter, which is shown in detail in fig. 15, num. 404.) to at least some of the pixel values of the first digital image (fig. 14, num. 316) to obtain a focus score (Fig. 13:"FOCUS SCORE") for the first digital image (fig. 14, num. 316); wherein the digital gradient filtering step (fig. 15, num. 404) includes a smoothing operation ("low pass filtering" is used with the filter 540 of fig. 14. as mentioned in col. 19, line 57.) having a settable spatial extent (Fig. 20, "a" or "b" distance is selective filtering as mentioned in col. 19, lines 21-28.).

Regarding claim 2, Ortyn discloses the method of claim 1, wherein the spatial extent (Fig. 20, "a" or "b" distance or range is selected filtering as mentioned in col. 19, lines 21-28.) of the smoothing function ("low pass filtering" is used with the filter 540 of fig. 14. as mentioned in col. 19, line 57.) is manually and/or electronically settable (The spatial extent or range is "designed using conventional techniques" in col. 19 , lines 33-36).

Regarding claim 3, Ortyn et al. discloses a method of autofocus for an optical instrument for viewing an object and having an auto-focusing mechanism, comprising the steps of:

Step 1: acquiring a first digital image (fig. 14, num. 316 receives an image via arrow 310) of the object (Oval shape next to numeral 508.) through the optical instrument (Fig. 14, 302 has magnification modes), the first digital image (fig. 14, num. 316) comprising a plurality of pixels having pixel values (The first image is formed from a CCD array of a camera as mentioned in col. 17, lines 48-52.);

Step 2: applying a digital filter (Fig. 14, num. 540 has a filter, which is shown in detail in fig. 15, num. 404.) to at least some of the pixel values of the first digital image (fig. 14, num. 314) to obtain a focus score (Fig. 13:"FOCUS SCORE") for the first digital image (fig. 14, num. 316); wherein the digital filter (Fig. 14, num. 540 has a filter, which is shown in detail in fig. 15, num. 404.) is defined by a mathematical smoothing function (fig. 13 has focusing function with triangle marks) having a negative (right side of a function with triangle marks) and positive lobe (left side of a function with triangle marks) around the origin thereof ("0" on the "Z POSITION AXIS"), the mathematical smoothing function (Fig. 13 has a function with triangle marks) having only one zero crossing (The function crosses the "Z POSITION OF SPECIMEN" axis once.) and being limited in spatial extent (from a range of –15 to +15 on the above mentioned axis.) in that it extends over a distance (-15 to +15 on the above mentioned axis.) smaller than or equal (The range of the function with triangle marks is equal to the range of a function with square marks.) to the image size (Another function has a range of –15 to +15 with

square marks that correspond to the filtered image.) and extends at least over three pixels (The" focusing system" which corresponds to the focusing function has a target range "between 7 and 19 pixels in size" in col. 18, lines 65,66) either side(The whole area of an object.) of a pixel (All pixels in the range) whose value is being filtered (The range of 7 to 19 pixels in size is being filtered).

Regarding claim 4, Ortyn et al. discloses the method according to claim 1, further comprising:

Step 3: moving the object (Oval shape next to numeral 508 is placed on a slide that is moved for each image signal as mentioned in col. 22, lines 8-14.) relative to the optical instrument (Fig. 14, num. 302 has magnification modes) along the optical axis (Fig. 14 has an optical axis shown by an arrow 110 and another arrow going out of 302.) thereof and acquiring a second digital image (Fig. 14, num. 316 is a camera as mentioned in col. 17, line 63) and a second focus score therefor (The camera of fig. 14, num. 318 is a focus minus camera that obtains focus scores shown in fig. 13 as the F^- curve.) in accordance with the method of steps 1 and 2 (The method of steps 1 and 2 are repeated for additional images of step 3.) ;

Step 4: continue moving the object (Oval shape next to numeral 508 is placed on a slide that is moved for each image signal as mentioned in col. 22, lines 8-14.) relative to the optical instrument (Fig. 14, num. 302 has magnification modes) along the optical axis thereof (Fig. 14 has an optical axis shown by an arrow 110 and another arrow going out of 302.) in the same direction in accordance with steps 1 to 3 to acquire at least three digital images (Fig. 14, numerals 314-318 are three cameras that obtains 1

image each for a total of three images as mentioned from col. 17, line 48 to col. 18, line 5.) and first to third focus scores (fig. 13 as three functions that correspond to the three images which each contain a respective focus score.) associated therewith; and

Step 5: determining from the first to third focus scores (fig. 13 as three functions that correspond to the three images which each contain a respective focus score.) a focus position ("0" on the Z POSITION OF SPECIMEN axis is a focused position as mentioned in col. 16, lines 64-66. Note the "0" position corresponds to two focus signals that are "equal" to each other as mentioned in col. 16, line 66.) for the object (Oval shape next to numeral 508) and moving (The oval shape, which is on a slide, is moved for proper focusing as mentioned from col. 16, lines 62 to col. 17, line 4.) the object (Oval shape next to numeral 508) and/or the optical instrument to this position (Fig. 14, num. 302 has magnification modes).

Claim 5 is similar to claim 4, except for step 3 that is disclosed by Ortyn et al.:

Step 3: determining (Normalizing a function F^- to determine corresponding normalized focus scores.) a first plurality of focus scores (Fig. 13 has a plurality of focus scores for a function F^-.) for the first digital image (fig. 14, num. 316) using the digital gradient filter (Fig. 14, num. 540 has a filter, which is shown in detail in fig. 15, num. 404 which produces the score shown in fig. 13) with a first plurality of spatial extents (The F^- has a plurality of spatial extents as shown by each position from –15 to +15) by applying (The method of steps 1 and 2 are performed for one image to obtain 256 focus minus scores as mentioned in col. 18, lines 32-34.) for each spatial extent (-15 to +15 or 30 spatial extents) the method steps 1 and 2.

Regarding claim 6, Ortyn et al. discloses the method according to claim 1, wherein the optical instrument is a microscope (Fig. 2, num. 510 is a microscope.)

Regarding claim 8, Ortyn et al. discloses the method according to claim 1, wherein the digital filtering function (“low pass filtering” is used with the filter 540 of fig. 14. as mentioned in col. 19, line 57.) is a one (Fig. 13 shows a function that corresponds to the filtering of fig. 14, num. 540 that has one dimension in the “Z POSITION”.) or two dimensional function.

Regarding claim 9, Ortyn et al. discloses the method according to claim 1, wherein the digital filtering function (“low pass filtering” is used with the filter 540 of fig. 14. as mentioned in col. 19, line 57.) is a Gaussian function (Fig. 13 shows a normalized function with triangle marks and a corresponding equation in figure 13 that is mentioned in col. 21, lines 1-6 that corresponds to the filtering of fig. 14, num. 540. Note that the specification states that a Gaussian function is “normal Gaussian curve” on page 12, line 2. Thus the normalized function with triangle marks in fig. 13 is a normal Gaussian curve.)

Regarding claim 10, Ortyn et al. discloses the method according to claim1, further comprising the step of selecting the spatial extent (Fig. 20, “a” or “b” distance is selective filtering as mentioned in col. 19, lines 21-28.). of the digital filtering function (“low pass filtering” is used with the filter 540 of fig. 14. as mentioned in col. 19, line 57.).

Regarding claim 11, Ortyn et al. discloses an optical instrument (fig. 1A, num. 516:IMAGE CAPTURE & FOCUS (ICF)) for viewing an object (fig. 16) and having an auto-focusing mechanism (Fig. 1A,num. 516 includes a focusing operation.),

the optical instrument (fig. 1A, num. 516:IMAGE CAPTURE & FOCUS (ICF)) being adapted to acquire a first digital image (via SCAN LINES in figure 1A) of the object (fig. 16) through the optical instrument,

the first digital image (via SCAN LINES in figure 1A is of a CCD array of pixels.) comprising a plurality of pixels having pixel values;

and the auto-focusing mechanism (Fig. 1A,num. 516 includes a focusing operation and num. 516 is shown in detail in figure 14.) having a digital gradient filter (Fig. 14, num. 540 has a filter shown in detail in fig. 15) to filter at least some of the pixel values of the first digital image (via SCAN LINES in figure 1A) and to obtain a focus score (The filtering of figure 15 is graphically shown in fig. 13 with a focus score on the vertical axis.) for the first digital image,

wherein the digital gradient filter (fig. 15) includes a smoothing function ("low pass filtering" is used with the filter 540 of fig. 14. as mentioned in col. 19, line 57.) having a settable spatial extent (Fig. 20, "a" or "b" distance is selective filtering as mentioned in col. 19, lines 21-28.).

Claim 12 was addressed in claim 2.

Claim 13 has been addressed in claims 3 and 11.

Regarding claim 14, Ortyn et al. discloses the optical instrument according to claim 11, further comprising:

a drive device (fig. 1A, num. 526:MOTOR DRIVERS) for moving the object (fig. 16) relative to the optical instrument (fig. 1A, num. 516:IMAGE CAPTURE & FOCUS (ICF)) along the optical axis thereof (fig. 2 is a detail of the ICF of fig. 1A, num. 516 that has an optical axis 110).

Regarding claim 15, Ortyn et al. discloses the optical instrument (fig. 1A, num. 516:IMAGE CAPTURE & FOCUS (ICF)) according to claim 11, the instrument being further adapted for determining from a plurality of focus scores (Fig. 13 has a plurality of focus scores on a vertical axis for three functions, F^-, F^+ and F) for a plurality of images (F^-, F^+ corresponds to two images) a focus position for the object (The function F is the final focused image based on the other two functions).

Regarding claim 16,Ortyn et al. discloses the optical instrument according to claim 15 further adapted for fitting ("normalized" functions of fig. 13 are adjusted to fit in a score range on the vertical axis.) the plurality of focus scores (Fig. 13 has a plurality of focus scores on a vertical axis for three functions, F^-, F^+ and F) to a polynomial function (The function of fig. 133 with square marks.) and determining the focus position (-5 on the Z POSITION AXIS) as a position to a maximum (-5 of the Z POSITION AXIS corresponds to a maximum score of 1 on the vertical axis.) of the polynomial function (The function of fig. 13 with square marks.)

Regarding claim 17, Ortyn et al. discloses the optical instrument (Fig. 1A, num. 516:IMAGE CAPTURE & FOCUS (ICF)) according to claim 15, the instrument being adapted to determine for each image a plurality of focus scores (Fig. 13 has a plurality of focus scores on a vertical axis for three functions, F^-, F^+ and F that correspond to three images.) using a plurality of spatial extents (The function of F^- and F^+ each have a range from –15 to +15 on the Z POSITION OF SPCIMEN axis.) for the digital filter (Fig. 14, num. 540 has a filter shown in detail in fig. 15).

Claims 18 and 25 were addressed in claim 8.

Claims 19 and 26 were addressed in claim 9.

Claim 20 was addressed in claim 6.

Claims 21 and 23 were addressed in claim 12.

Claim 22 was addressed in claim 11.

Claim 24 was addressed in claims 11 and 3.

Claim 27 was addressed in claim 15.

Claim 28 was addressed in claim 16.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Avinash (US Patent 5,561,611 A) is pertinent as teaching a method of using spatial extent as mentioned using figure 5.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dennis Rosario-Vasquez whose telephone number is 703-305-5431. The examiner can normally be reached on 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Boudreau can be reached on 703-305-4706. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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